



## Assessment of Case of Clavicle Fracture Managed with Locking Plates

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(Received: 07 October 2023

Revised: 12 November

Accepted: 06 December)

### KEYWORDS

#### Abstract

A lot of controversies have been found regarding the optimal treatment strategy for "distal clavicle structures". In the context of surgical strategy, a combination of titanium cables along the locking plate of the distal clavicle has been used. The main aim of this study is to find out the clinical outcomes of the newer type of strategy for treating "Neer type II distal clavicle fractures". 21 participants comprising patients and doctors have been chosen for the analysis of distal clavicle fracture of Neer type II. Through reviewing and collecting follow-up data the clinical outcomes will be assessed at different rates. The use of a distal clavicle locking plate along with the combination of titanium cable of Neer, type features has been found to better function of the shoulder. This type of joint surgical strategy has been found as an effective process of treating unstable clavicle fractures.

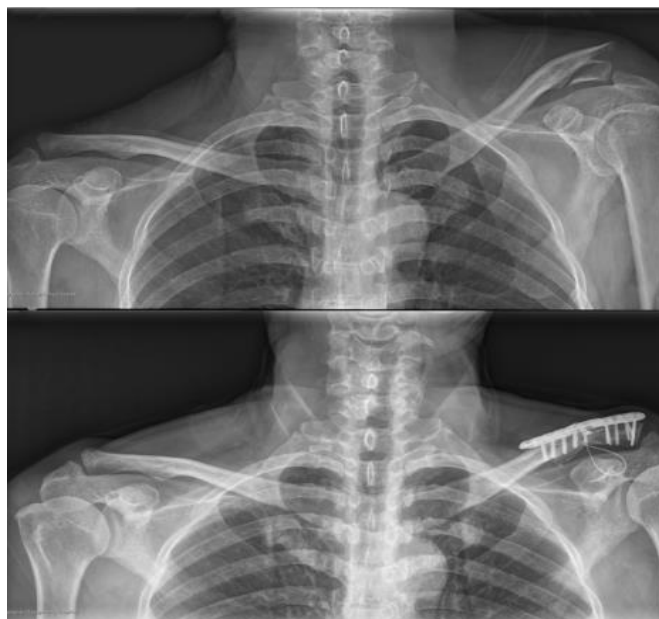
### 1. Introduction

The clavicle structures are found as common types. Among adults, these fractures account for 5% while this is 15% for children. Moreover, around 28% of fractures have been involved within the distal clavicle. Therefore, Neer has been classified into two basic types, this depends upon the continuity of the coracoclavicular ligament, and the other is a special type which is an intra-articular extension with Neer's classification [5]. In the case of Neer type II fracture, the coracoclavicular ligaments have been found detached from the medial fragment. In resulting of this these fractures are found as displaced or unstable significantly, With the context of conservative treatment it has been reported that the result the delayed union rates and higher nonunion rates [1]. Nevertheless, surgical treatment has been found to be one of the best choices for orthopedic surgeons while dealing with "Neer type II distal clavicle fractures".

Several operative techniques have been applied for treating Neer type II fractures. Though no single

technique has been found as the golden standard treatment. Presently the locking plate implication along with a defined contoured design has been introduced for the treatment of "distal clavicle fractures". With these kinds of implants, the fixation stability can be developed through enabling locking screws. These screws have been inserted with distal fragments. Without coracoclavicular ligament reconstruction, this technique might not be able to defend the "vertical directed forces" [3]. There are multiple studies that can be proposed for the use of the stabilisation of the coracoclavicular technique in the treatment of high clavicle structure.

In regard to this, titanium cables have been used in orthopedic surgeries. This process is also successfully implemented for "acromioclavicular joint dislocation" treatment. In using titanium cable, it has not been sufficient in dealing with the clavicle fracture treatment. Through evaluating hypotheses this combined surgery process has been found as effective in unstable clavicle fracture types.



**Figure: Radiograph with increased coracoclavicular distance**

Source: [1]

## II. Method

### Study population

Within this, a series of retrospective case series have been chosen. The patients and doctors who are attached to this type of combined surgery have been questioned for enlisting responses. In the part of inclusion and exclusion criteria, accurate features with patients aged above 18 years have been selected. Therefore exclusion criteria have been patients with the old fracture, concomitant plexus, nerve injuries, and so on. For comparison of displacement status the radiographs of the "contralateral shoulder" have been chosen.

### Surgical technique

In the surgical techniques, all of the surgeries have been performed under general anesthesia types. Therefore, the coracoid process has been exposed through the separation of deltoid fibers. After the identification of lateral and medial fragments, the soft tissues have been

curetted in between fractal ends [2]. In case of committed fragments, the Kirschner wires have been inserted through the acromioclavicular joint. At last Fluoroscopy was performed to confirm the implant's displacement along with reduction.

### Postoperative care

Through checking of the shoulder sling the surgical techniques have been delivered with the stable fixation in case of both horizontal and vertical directions. Passive exercise was started after the 3 days of operation surgery. After four weeks the active notion of injured shoulder has been encouraged.

### Outcome evaluation

For evaluating, radiographs of patients have been obtained in assessing the healing fracture. Through this a motion range also has been recorded along with the modified constant score and UCLA score. Additionally, a "visual analogue scale" (VAS) has been evaluated also.

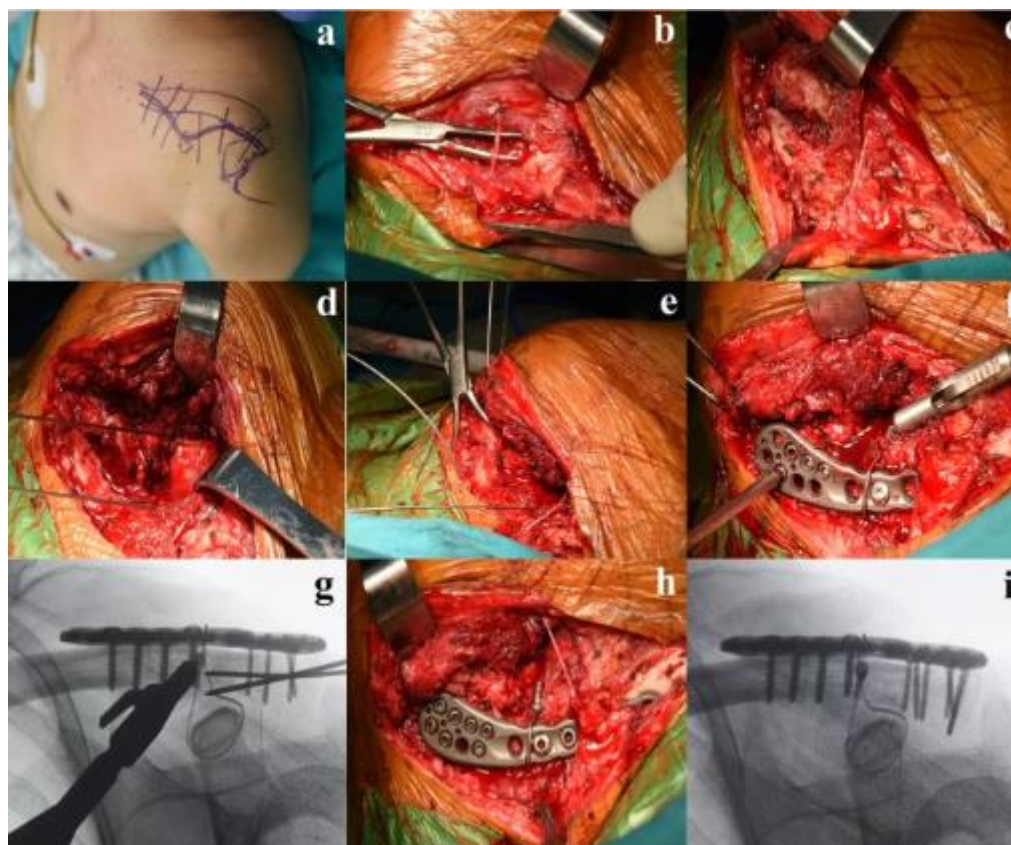


Figure: Surgery procedure

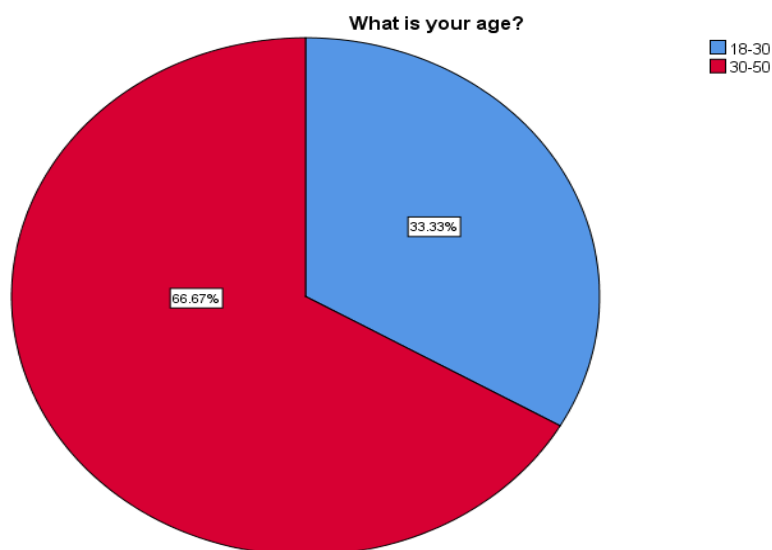
Source: [1]

### III.Results

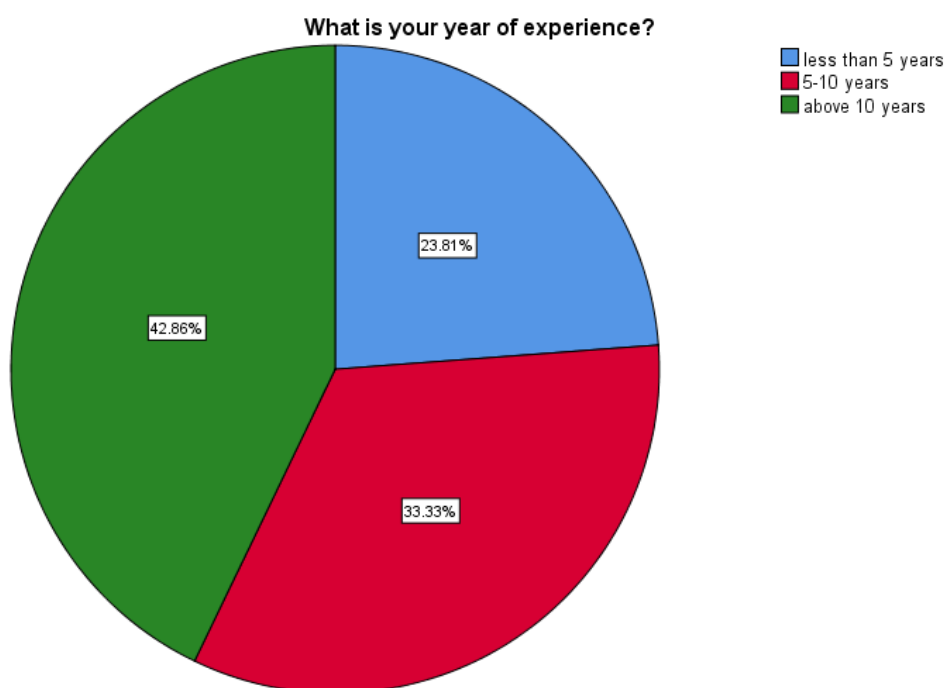
		Statistics						
		What is your age?	What is your year of experience?	Osteosynthesis is value is dependent on overall complication rate of 23%. Agree or Disagree?	The radiological and clinical indications to perform osteosynthesis of mid-shaft clavicle fractures are still debated, and the suggested technique, choice of plate and position also vary. Agree or Disagree?	Constant and DASH scores are important understanding midshaft clavicle fracture. Agree or Disagree?	Decreased level of function (whether related to ROM or strength) seems to be the commonest complication observed after locking plate osteosynthesis. Agree or Disagree?	Decreased function can be anticipated in some patients following a midshaft clavicle fracture, irrespective of the treatment strategy. Agree or Disagree?
N	Valid	21	21	21	21	21	21	21
	Missing	0	0	0	0	0	0	0
Mean		1.67	2.19	3.19	3.52	2.43	3.52	3.62
Std. Error of Mean		.105	.178	.255	.273	.213	.255	.253
Median		2.00	2.00	4.00	4.00	2.00	4.00	4.00
Mode		2	3	4	4	2	4	4
Std. Deviation		.483	.814	1.167	1.250	.978	1.167	1.161
Variance		.233	.662	1.362	1.562	.957	1.362	1.348
Skewness		-.763	-.381	-.824	-.484	.752	-.585	-1.273
Std. Error of Skewness		.501	.501	.501	.501	.501	.501	.501
Kurtosis		-1.579	-1.363	-.300	-.966	-.607	-.529	.924
Std. Error of Kurtosis		.972	.972	.972	.972	.972	.972	.972
Range		1	2	4	4	3	4	4

In the above descriptive statistics table has been presented. There is no missing value. The maximum std.

The deviation value is 1.250 while the minimum value is presented as 0.483.



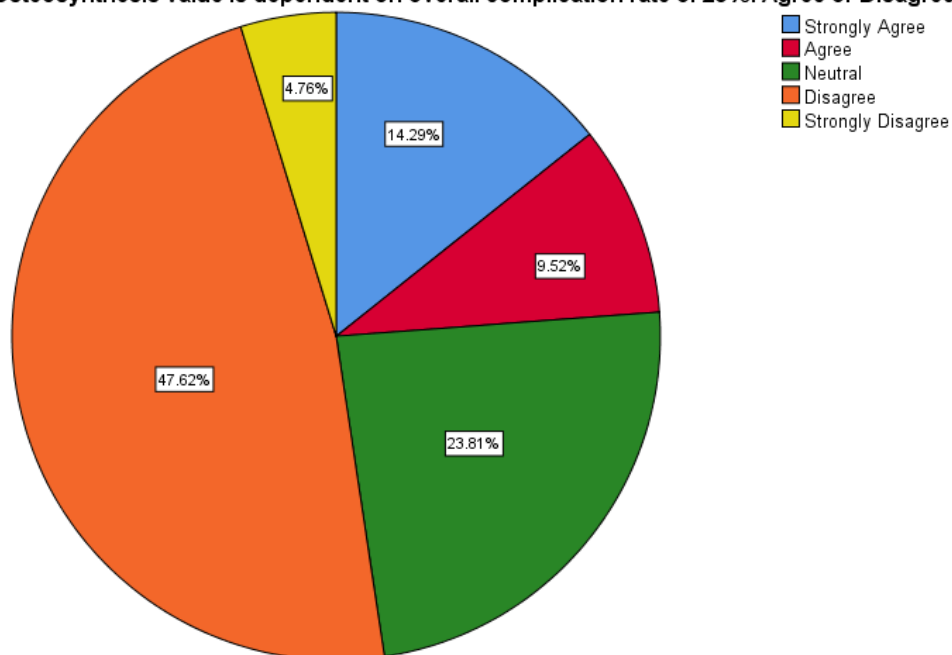
Of all respondents there are 66.67% were found within the age range of 30-50 years.



Among participants, 42.86% of respondents have more than 10 years while 23.81% are found with less than 5 years of experience.

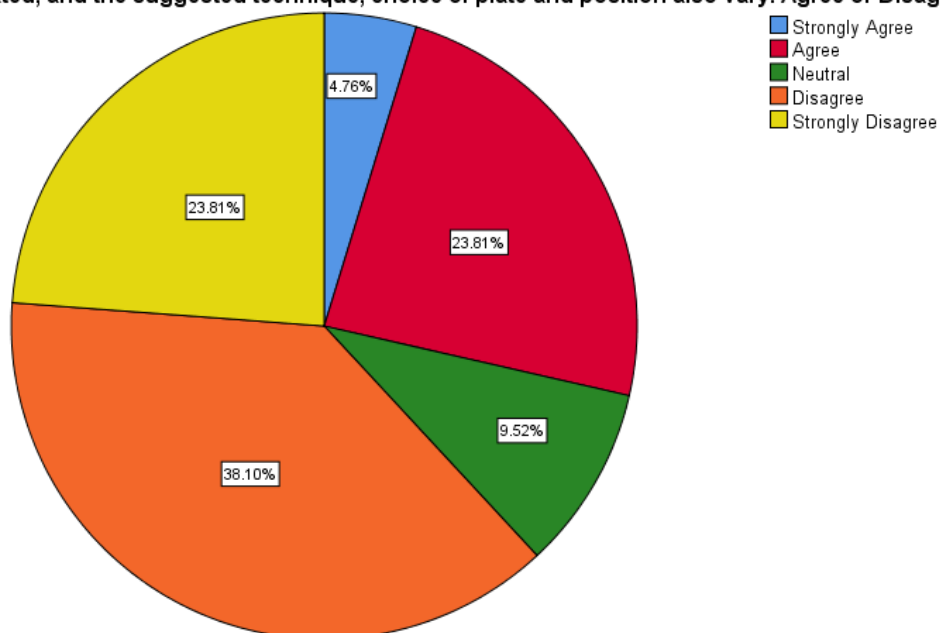


**Osteosynthesis value is dependent on overall complication rate of 23%. Agree or Disagree?**



There 14.29% of participants strongly disagreed with the osteosynthesis value is dependent on the total complication rate. While 47.62% disagreed with this.

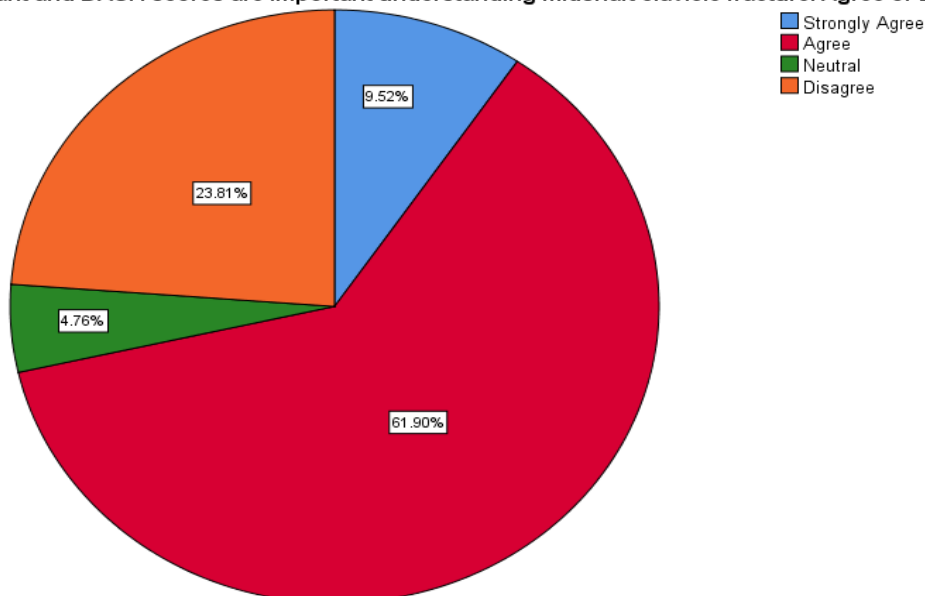
**The radiological and clinical indications to perform osteosynthesis of mid-shaft clavicle fractures are still debated, and the suggested technique, choice of plate and position also vary. Agree or Disagree?**



Around 23.81% has been agreed on both clinical and radiological indications in performing osteosynthesis. After that 9.52% of participants stayed neutral on this question.

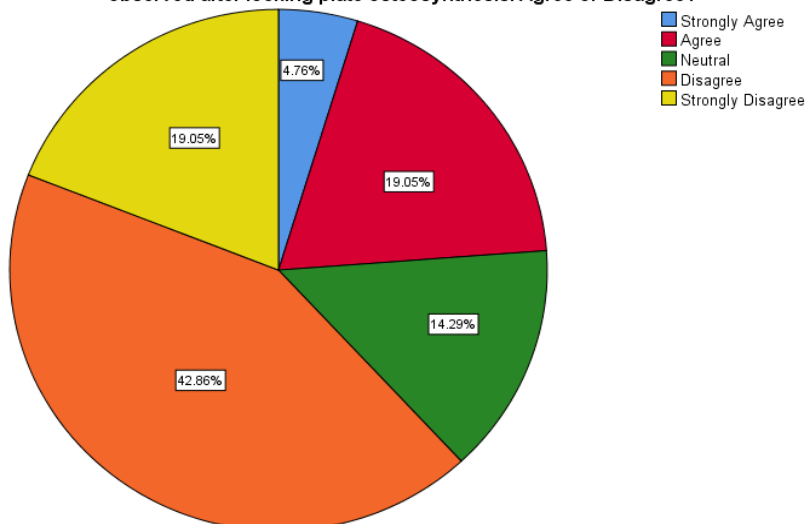


**Constant and DASH scores are important understanding midshaft clavicle fracture. Agree or Disagree?**



In measuring midshaft clavicle fracture there are 61.90% of participants agreed upon this while 23.81% also disagreed with this.

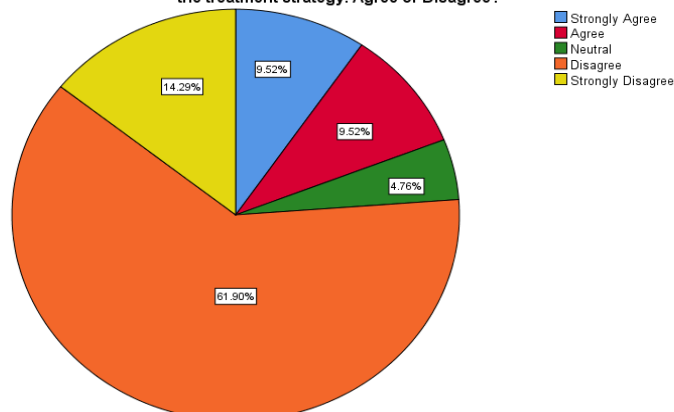
**Decreased level of function (whether related to ROM or strength) seems to be the commonest complication observed after locking plate osteosynthesis. Agree or Disagree?**



For decreased function levels around 19.05% of participants have found this as a common complication after locking plate osteosynthesis.



Decreased function can be anticipated in some patients following a midshaft clavicle fracture, irrespective of the treatment strategy. Agree or Disagree?



In question 7, there have been 61.90% of participants have been found in disagreeing that decreased function can not be found with midshaft clavicle fracture.

#### Descriptive Statistics

	Mean	Std. Deviation	N
What is your age?	1.67	.483	21
What is your year of experience?	2.19	.814	21
Osteosynthesis value is dependent on overall complication rate of 23%. Agree or Disagree?	3.19	1.167	21
The radiological and clinical indications to perform osteosynthesis of mid-shaft clavicle fractures are still debated, and the suggested technique, choice of plate and position also vary. Agree or Disagree?	3.52	1.250	21
Constant and DASH scores are important understanding midshaft clavicle fracture. Agree or Disagree?	2.43	.978	21
Decreased level of function (whether related to ROM or strength) seems to be the commonest complication observed after locking plate osteosynthesis. Agree or Disagree?	3.52	1.167	21
Decreased function can be anticipated in some patients following a midshaft clavicle fracture, irrespective of the treatment strategy. Agree or Disagree?	3.62	1.161	21

#### Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Sig. F Change	Durbin-Watson
					R Square Change	F Change	df1	df2			
1	.925 <sup>a</sup>	.856	.809	.356	.856	17.889	5	15		.000	1.080

a. Predictors: (Constant), Decreased function can be anticipated in some patients following a midshaft clavicle fracture, irrespective of the treatment strategy. Agree or Disagree?, Constant and DASH scores are important understanding midshaft clavicle fracture. Agree or Disagree?, The radiological and clinical indications to perform osteosynthesis of mid-shaft clavicle fractures are still debated, and the suggested technique, choice of plate and position also vary. Agree or Disagree?, Osteosynthesis value is dependent on overall complication rate of 23%. Agree or Disagree?, Decreased level of function (whether related to ROM or strength) seems to be the commonest complication observed after locking plate osteosynthesis. Agree or Disagree?

b. Dependent Variable: What is your year of experience?





Within the model summary analysis the change statistics have been presented in where the Sig. F change is 0.000 along with an Adjusted R square value of 0.809.

### ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.337	5	2.267	17.889	.000 <sup>b</sup>
	Residual	1.901	15	.127		
	Total	13.238	20			

a. Dependent Variable: What is your year of experience?

b. Predictors: (Constant), Decreased function can be anticipated in some patients following a midshaft clavicle fracture, irrespective of the treatment strategy. Agree or Disagree?, Constant and DASH scores are important understanding midshaft clavicle fracture. Agree or Disagree?, The radiological and clinical indications to perform osteosynthesis of mid-shaft clavicle fractures are still debated, and the suggested technique, choice of plate and position also vary. Agree or Disagree?, Osteosynthesis value is dependent on overall complication rate of 23%. Agree or Disagree?, Decreased level of function (whether related to ROM or strength) seems to be the commonest complication observed after locking plate osteosynthesis. Agree or Disagree?

In the above table, the Anova table has been presented which shows the F value of 17.889.

### Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.960	.969	7

A higher level of internal consistency between variables has been observed as per the value of Cronbach alpha which denotes 0.960. In statistical analysis, the standardized value of Cronbach alpha is the first and foremost crucial aspect that indicates the internal

consistency between variables is dependent on the correlation and movement of the variable. Moreover, 7 items indicate the variance level is not optimal. The reliability statistics indicated that variables can move on the same plane.

### Scale Statistics

Mean	Variance	Std. Deviation	N of Items
20.14	42.229	6.498	7

The scale statistics table has been presented with std. Deviation value of 6.498 with the variance level of 42.229. The value for the standard deviation value is

more or less correlated with the mean value that shows the analysis is statistically significant.





## ANOVA with Tukey's Test for Nonadditivity

			Sum of Squares	df	Mean Square	F	Sig
Between People			120.653	20	6.033		
Within People	Between Items		76.082	6	12.680	52.360	.000
	Residual	Nonadditivity	9.104 <sup>a</sup>	1	9.104	54.282	.000
		Balance	19.958	119	.168		
		Total	29.061	120	.242		
	Total		105.143	126	.834		
Total			225.796	146	1.547		

Grand Mean = 2.88

a. Tukey's estimate of power to which observations must be raised to achieve additivity = -.099.

In above the ANOVA Turkey's test for Nonadditivity has been presented with a GrandMean of 2.88. The sig value is 0.000 which is correct.

## Hotelling's T-Squared Test

Hotelling's T-Squared	F	df1	df2	Sig
147.971	18.496	6	15	.000

In the above part, Hotelling's T-squared test has been presented with F - 18.496. Therefore, the first degree of freedom (df1) is 6.

## IV.Discussion

The cause of surgical treatment of "Neer type II distal clavicle features" has been found due to the higher complication and nonunion rate in association with the conservative treatment. Hook plate fixation can be found as an effective treatment for unstable clavicle fracture management. Though the use of "a pre-contoured locking plate has been considered as the effect treatment. Comminuted fracture along with bone quality has been found as insufficient in maintaining stability. In regard to this the "CC screw fixation" has also been considered as the classical method in CC stabilisation. Regarding this titanium cables have been found with biochemical properties which can deliver with 1000N bearing for reconstructing of ligament CC types [1]. For dealing with the comminuted "distal clavicle features" unstable types the titanium cable has been mixed with the maintaining of fracture stability. In the present years, these locking

plates can be combined with the "CC stabilisation technique" in treating these fractures. For the follow up no other bony arrosion has been detected.

## V.Conclusion

In this study, the treatment and success rate of the titanic cable has been evaluated of "distal clavicle locking plate" in joining of "Neer type II fractures". Through delivering rigid fixation towards elastic fixation the rigid fixation can be reinforced through preserving capacity in the stabling of AC joints [4]. From the reported study, it has been found that the patients who are diagnosed with distal clavicle fracture have been introduced to the combined surgical strategy as part of a reliable treatment process. Through considering study limitations the combined surgical method has been explored against other surgical methods which have been needed with stronger evidence while supporting treatment.

## VI.Reference List

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